

---

**Nucleic acid extraction efficiency and bacterial recovery from maxillary sinus mucosal samples obtained by brushing or biopsy.**

**Journal:** Am J Rhinol Allergy

**Publication Year:** 2010

**Authors:** Frederick C Roediger, Nicole A Slusher, Silke Allgaier, Michael J Cox, Steven D Pletcher, Andrew N Goldberg, Susan V Lynch

**PubMed link:** 20819463

**Funding Grants:** SFSU Bridges to Stem Cell Research

**Public Summary:**

BACKGROUND: Chronic rhinosinusitis (CRS) is a common disease with a complex pathophysiology involving a microbial component. Culture-independent molecular analysis represents a promising new approach to clarify the microbiology of CRS, but standardized, optimized sampling methods still have not been defined. This study was designed to compare nucleic acid extraction rates and recovery of bacteria for two methods of sampling the maxillary sinus, mucosal biopsy, and brushing. METHODS: Samples were obtained from 20 patients undergoing maxillary sinus surgery. Total extracted nucleic acid concentration and bacterial burden were compared between sample types. RESULTS: Total nucleic acid concentration varied across patients. No statistically significant difference in mean total DNA concentration from mucosal biopsy specimens or brushings was observed. However, compared with biopsy specimens, brush samples possessed a significant ( $p < 0.035$ ) increase in bacterial copy number. CONCLUSION: Endoscopically directed mucosal brushings of the maxillary sinus provide equivalent concentrations of total DNA to mucosal biopsy specimens but possess greater concentrations of bacterial DNA, likely because of the greater surface area sampled by this method. Given the additional advantage of lower risk associated with obtaining brush samples, we suggest they represent the preferred sampling method for future genomic sinus studies.

**Scientific Abstract:**

BACKGROUND: Chronic rhinosinusitis (CRS) is a common disease with a complex pathophysiology involving a microbial component. Culture-independent molecular analysis represents a promising new approach to clarify the microbiology of CRS, but standardized, optimized sampling methods still have not been defined. This study was designed to compare nucleic acid extraction rates and recovery of bacteria for two methods of sampling the maxillary sinus, mucosal biopsy, and brushing. METHODS: Samples were obtained from 20 patients undergoing maxillary sinus surgery. Total extracted nucleic acid concentration and bacterial burden were compared between sample types. RESULTS: Total nucleic acid concentration varied across patients. No statistically significant difference in mean total DNA concentration from mucosal biopsy specimens or brushings was observed. However, compared with biopsy specimens, brush samples possessed a significant ( $p < 0.035$ ) increase in bacterial copy number. CONCLUSION: Endoscopically directed mucosal brushings of the maxillary sinus provide equivalent concentrations of total DNA to mucosal biopsy specimens but possess greater concentrations of bacterial DNA, likely because of the greater surface area sampled by this method. Given the additional advantage of lower risk associated with obtaining brush samples, we suggest they represent the preferred sampling method for future genomic sinus studies.

---

**Source URL:** <https://www.cirm.ca.gov/about-cirm/publications/nucleic-acid-extraction-efficiency-and-bacterial-recovery-maxillary-sinus>